Are They Really as Bad as They Seem? Nonresponse Rates at the End of the Twentieth Century

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Although nonresponse to surveys of the general population seems to be increasing, very little research has looked specifically at trends for telephone surveys that use random digit dial sampling methods. Our society and those of other countries rely on random digit dial surveys to provide information on which many important policies are based. Furthermore, new communication technologies and the ubiquity of telemarketing threaten telephone surveys. For these reasons, we examine nonresponse in the 1990s for two RDD surveys, one national and the other state level, tracing changes in three categories of nonresponse – refusals, noncontacts, and other noninterviews. Although we expected noncontacts to have increased substantially in these surveys, we found that this trend was clearly evident only in the core metropolitan counties of the state we studied. However, this development promises to become widespread in the near future, and we recommend that survey methodologists plan now for this eventuality.

Key words: RDD samples; noncontact rate; refusal rate; communication technologies.

1. Introduction

Most survey researchers hold that nonresponse to surveys constitutes a major problem that is getting worse (Riche 1990; Groves 1989; Groves and Couper 1998; Hox and De Leeuw 1994; Harris-Kojetin and Tucker 1999) despite a few studies that have produced contradictory evidence (Smith 1995; DeHeer 1999). The average potential respondent, angered by calls during the dinner hour, seems more and more likely to demand, ''Take my name off your list,'' or so it has seemed. This development has occurred in surveys conducted both in the United States and in other countries (DeHeer 1999; Djerf 1999) and seems to be most noticeable in telephone surveys where telemarketing has eroded receptivity to legitimate survey research (DeHeer 1999; CMOR 1995, 1997, 1999). Although methodologists in the United States have tended to stress refusals as the major source of nonresponse (Groves and Couper 1998), European scholars have pointed to noncontacts as an important contributing factor (DeHeer 1999; Djerf 1999). It is clear that only the most rigorously conducted surveys report a response rate above 70 percent and, through the efforts of the Council for Marketing and Opinion Research (CMOR), we now know just how low response rates in commercial telephone surveys are. Using AAPOR standard

definitions, CMOR calculates average response rates for twelve to fifteen minute telephone surveys that range from 25 percent for all types of samples to 12 percent for RDD samples. What is not clear, except in a few instances, is how these rates have changed over time or, to look at it in reverse, how nonresponse may have changed. Such changes in the character and type of nonresponse have not been studied sufficiently. Although Steeh (1981) examined trends for rates of refusals and other noninterviews in the period 1952–1979, her conclusions, based almost entirely on face-to-face interviews, have little meaning in the current survey environment where the telephone mode of administration and random digit dial samples are the norm.

The research reported below takes account of this shift from personal to telephone interviewing and examines three research questions:

1) Has nonresponse in RDD telephone surveys increased at the end of the twentieth century?
2) Is the character of nonresponse in RDD telephone surveys shifting from refusals to other types of nonresponse, predominantly noncontacts, a shift propelled in large part by technological changes in the form of such new communication devices as answering machines, caller id, cellular phones, and pagers?
3) Does nonresponse to telephone surveys differ in composition from nonresponse to personal interview surveys as the greater intrusiveness of call attempts, the less precise sampling methods, and the more impersonal nature of the interviewer-respondent interaction would lead us to expect?

We search for evidence that will address these issues using a standard trend analysis that allows for the possibility of curvilinearity. Comparing the components of nonresponse over time allows us to determine whether or not it is becoming more and more difficult to contact sample households. Because we do not have trend data for a personal interview survey, we will have to approach the third question indirectly by comparing the patterns of nonresponse in surveys that use a random digit dial sample with patterns we know from other research exist for face-to-face surveys. Here we rely particularly on analyses that break down nonresponse rates by urban groups.

2.   Data Description

The data for this study come from two surveys, one national and the other state-level. Both surveys have been repeated at regular intervals over a long enough period of time for us to compare trends in nonresponse. The main features of each study are highlighted below, but more detailed methodological information is presented in the Appendix.

2.1.   *Survey of consumer attitudes*

The University of Michigan's Survey of Consumer Attitudes (SCA) is a national telephone study that has been conducted each month since 1977. It is intended primarily to measure changes in consumer sentiments regarding the economy although it also serves as a kind of omnibus survey with scholars and organizations purchasing time on the survey to ask questions related to their interests. While each monthly SCA typically consists of

about 60 percent new respondents and 40 percent reinterviews from a previous month, the present analysis utilizes only new cases. This amounts to at least 300 interviews for each monthly survey. For most analyses, the SCA monthly data have been summed into quarters for a total of approximately 900 interviews per quarter.

2.2. Georgia State Poll

Georgia State University's quarterly Georgia State Poll (GSP) comprises the second set of data for the analysis. Conducted since 1992, the survey has a relatively short time span. Questions involve current issues facing the state and nation as well as items sponsored by various Georgia State University faculty, state agencies, and nonprofit groups that cover a variety of subjects. The sampling frame is split into two subsamples consisting of households within the metropolitan Atlanta area defined as the five central counties in the Atlanta MSA (Fulton, DeKalb, Clayton, Gwinnett, and Cobb) and those outside this five county area, with the goal of obtaining 400 completed interviews from each subsample. Unfortunately, data for both subsamples are available only from the summer of 1995 through the fall of 1999.

2.3. Comparison of the two surveys

The two data sources are comparable on several key characteristics but differ on others. Both surveys employ a random digit dial sampling design with inclusion in the sample limited to adults age 18 years or older living in households. Although the sampling frames of the two surveys differ in scope (one is national, the other statewide), the types of areas included are similar. Both the GSP and the SCA samples contain residents of major metropolitan areas, large cities, small towns, and rural areas. Both surveys ask respondents' opinions regarding relatively nonthreatening and nonsensitive topics. The two surveys are conducted by organizations centered in universities that are well known in their respective calling areas.

While similar in many respects, the SCA and GSP differ notably along certain dimensions. In addition to having different geographic scopes the two surveys select respondents by different methods. The SCA switched from the Kish procedure to a random adult method in the summer of 1997 while the GSP has employed the ''last birthday'' technique except in the summer 1999 survey when the Kish selection procedure was substituted. Also, the SCA has at times offered both interviewer and respondent incentives, while the GSP has never given incentives to respondents and only occasionally to interviewers. This difference might help explain some of the discrepancy in response rates between the two surveys. Interview length is another area of inter-survey divergence, with the SCA typically approaching 30–35 minutes in length and the GSP closer to 15 minutes. Finally, although the methodological procedures used in the GSP changed very little over the time span covered by this study, the SCA instituted several new procedures, the most prominent being the shift in 1996–1997 from paper and pencil interviewing to a CATI administration. Another change to be discussed below caused such a break in the SCA time series that we had to compensate by obtaining the original call histories for surveys conducted after October 1998 and reassigning final dispositions to all cases in the RDD portion of the sample.

3. Variables and methods

3.1. Refusal rate

Any careful study of nonresponse must distinguish its component parts and state explicitly how each is being defined. Groves and Couper (1998) divide nonresponse into three categories – refusals, noncontacts, and other noninterviews, a classification that we find useful. However, as we will see, it is not clear what kinds of outcomes should fall into each group. At this time, little agreement about these definitions exists across survey organizations or even across time within the same organization. We begin with refusals because they are perceived as being the predominant type of nonresponse and, as a result, receive the most attention in the methodological literature.

In these analyses, we have followed the formula for calculating a refusal rate that is listed as REF1 in the Standard Definitions manual published by the American Association for Public Opinion Research (2000, p. 39). REF1 defines the base of the percentage broadly to include every sample unit that cannot be definitely classified as nonsample. This then is the base we will use to calculate the noncontact and other noninterview rates as well. The formula, however, is not specific about what should go in the numerator of the refusal rate. Even though some of the disposition codes used in the past are vague, we have tried to standardize definitions across the two surveys (see the Appendix).

Until November 1998, SCA staff assigned final dispositions to all nonresponding cases after a careful review of the relevant call histories. Refusals included such outcomes as final refusal by respondent, final refusal by someone other than the respondent, and final refusal before the respondent could be determined. A redefinition of dispositions in 1976 required that all potential respondents who postponed an interview more than twice should also be classified as refusals (Steeh 1981). Our analyses indicate that this practice continued until October 1998, surviving a second redefinition in 1995. However, beginning in November of that year, study staff no longer examined individual call histories to assign final dispositions but instead accepted the outcome of the last call attempt. As a result, refusal rates plummeted and noncontact rates soared. Since we wanted to keep these most recent data in our analyses, we recoded the final dispositions for each survey after October 1998 using a computer algorithm identical to the algorithm that determined final dispositions for the Georgia State Poll. Thus we achieved enough consistency in definitions, including counting more than two postponements of an interview as a refusal, to feel we could extend our analyses of the SCA through the end of 1999.

The dispositions included in the numerator of the refusal rate for the Georgia State Poll from the mid-1990s through the first quarter of 1999 covered the same sorts of refusal outcomes. In addition, any call attempt with the disposition, ''introduction only,'' a disposition not used at all by the SCA, was treated as a refusal. To make the refusal rates for the two surveys as comparable as possible, we also coded as refusals those cases that postponed an interview more than twice. In the Spring 1999 Georgia State Poll, disposition codes were changed in minor ways – the ambiguous disposition ''introduction only'' was eliminated – so that the definitions would be self-evident to interviewers.

In sum, we see for both surveys that coding refusal outcomes can be quite subjective and is probably not stable over time. Passive refusals are common, and it is not always easy to

know in the end how a case should be classified – especially when interviewers, rather than study staff, carry out the final coding. This dilemma injects a note of uncertainty into any analysis of types and trends of nonresponse. We have attempted to overcome this uncertainty by treating any outcome that even vaguely resembles a refusal as a refusal.

3.2. Other nonresponse rates

In line with Groves and Couper (1998), we will treat nonresponse due to reasons other than refusals as having two components, noncontacts and other noninterviews. There are difficulties in doing this. In the past, survey organizations have reduced noncontacts to a negligible level in both telephone and personal interview surveys by making unlimited call attempts. The SCA provides evidence of the effectiveness of this strategy. The call histories from November 1998 to December 1999 that we were able to analyze show extremely low levels of noncontacts (less than 1 percent of households in each survey). In the Georgia State Polls considered here, either a person or a machine answered 95.6–99.8 percent of all household numbers not definitely classified as nonsample. However, when we look at the pattern of no answer, busy, and answering machine dispositions across all call attempts in each Georgia State Poll, we find a much larger percentage of sample units (about 16 percent) where interviewers never actually talked to a person during the entire study period. Thus the composition of the nonrefusal component of nonresponse differs across the two surveys. In the SCA nonrefusals refer almost exclusively to conditions such as illness during the study period, difficulties speaking English, and instances when chosen respondents were unavailable because of a heavy work schedule or because they were seldom at home. In the Georgia State Poll nonrefusals are composed of noncontacts as well as these conditions. As a result, we cannot neatly divide this component of nonresponse into the two categories mentioned by Groves and Couper (1998) in comparisons across the two surveys. Instead this type of nonresponse must be conceived as one comprehensive category called nonrefusals. However, in subsequent analyses of the Georgia State Poll data, we will be able to separate this component into noncontacts and other types of noninterviews. We do this because we believe these distinctions effectively capture the nuances that are necessary for understanding nonresponse in the 1990s and beyond.

Our analysis will trace as accurately as possible the trends for these three types of nonresponse: nonrefusals, noncontacts, and other noninterviews. We ask whether each trend can be described as linear or curvilinear because we are interested in finding the shape that best fits the data. In addition, we are interested in uncovering broader cyclical patterns that may have resulted from changes in survey methodology. Statistically, we fit second and third degree curves to the data points, choosing a curve only if it produces a significant improvement in the explained variance as compared to a linear function.

4. Overall Trends, Survey of Consumer Attitudes, 1980–1999

We begin our discussion of nonresponse by looking first at the Survey of Consumer Attitudes, the gold standard for RDD surveys, over a twenty-year period. From the basic descriptive statistics given in Table 1, we see that during this long period, the response rate for the SCA averages 70 percent and the corresponding nonresponse rates together average about 30 percent. Refusals are the predominant form of nonresponse, just as we

would have expected on the basis of research covering the three decades prior to 1980 (Steeh 1981). Whether the nonresponse rates are considered high or low depends in large part on one's perspective. Compared to the levels of past nonresponse in personal interview surveys, these rates are high. As we will see, however, compared to the levels exhibited by other, less well-established RDD studies conducted in the present, they seem extraordinarily low.

The more interesting question involves the extent to which the nonresponse rates for the SCA have worsened over the last twenty years. Examination of the time series in Figure 1 suggests that the trends to the end of 1999 were essentially linear for both types of nonresponse. The substantial fluctuations in the rates after November 1998 indicate that we were not completely successful in replicating the decision processes used by SCA study staff to assign refusal dispositions. However, aggregating the series by quarters, as we will shortly show, considerably moderates these swings. Table 2 displays the regression coefficients that indicate the amount of change that occurred per month for each type of nonresponse rate since 1980. The importance of the refusal component of nonresponse is evident from the fact that 76 percent of the decline in response rates can be attributed to an increase in refusals.

However, despite their statistical significance, the increase in both types of nonresponse are relatively modest. This conclusion seems both intuitively and empirically valid. The increase in the refusal rate for the SCA between 1952 and 1979 was .126 percentage points per quarter or about half a percentage point per year as opposed to .08 per quarter and .33 percentage points per year over the last twenty years. In all, during the period 1952–1979, refusal rates on the SCA rose 11.5 percentage points, a substantial increase compared to the overall 6.7 percentage point increase that has occurred since then. The other noninterview rate, on the other hand, changed at approximately the same rate – .021 per quarter during the period 1952–1979 and .02 per quarter in the subsequent period or .1 percent a year. Furthermore, there is no evidence of broad swings that would suggest substantial methodological effects beyond those we have already mentioned. The change to CATI administration appears to have had little impact.

Table 1.   *Descriptive statistics: Georgia State Poll and Survey of Consumer Attitudes, 1980–1999*

|	(N)	Response rate		Refusal rate		Nonrefusal rate	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Survey of Consumer Attitudes							
Monthly: 1980–1999	233	69.79	3.4	20.59	3.4	9.62	2.4
Quarterly: 1995–1999	18	65.85	1.9	23.79	2.2	10.35	1.6
Georgia State Poll Summer 1995–Fall 1999							
Overall	18	36.75	4.7	40.16	5.2	23.10	3.9
NonMSA	18	39.49	5.3	40.25	5.0	21.01	3.4
Large cities	18	40.15	5.5	39.69	5.5	20.51	4.8
Suburban	18	37.38	6.5	43.40	5.9	20.49	4.7
Metropolitan	18	35.39	4.9	39.40	6.1	25.21	5.0
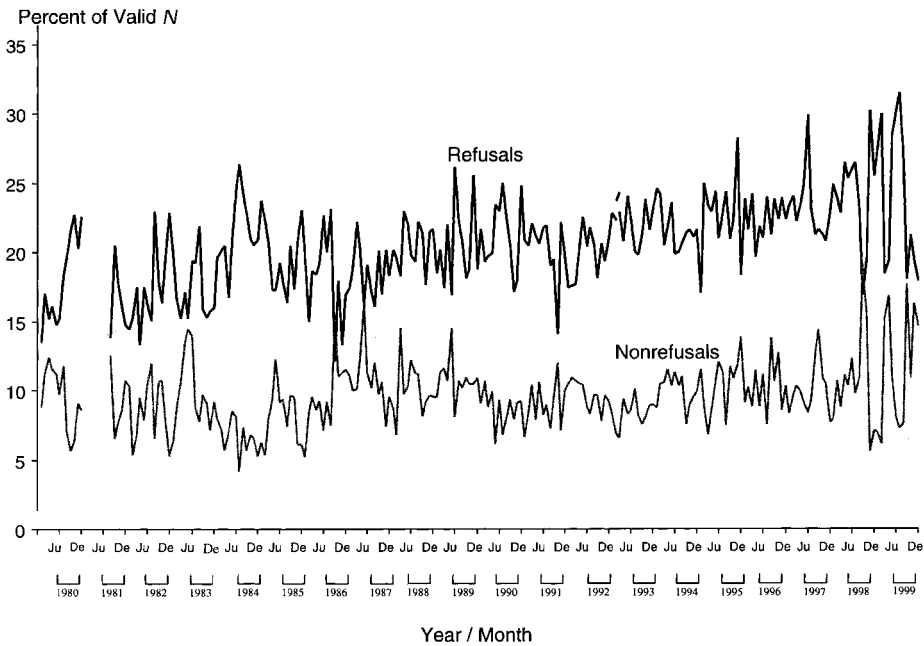
Fig. 1. Nonresponse rates; Survey of consumer attitudes, 1980–1999

5.   Trends in Nonresponse During the 1990s

Although we do not have trends by types of nonresponse that go back to 1980 for another survey, we can compare the more recent nonresponse patterns of the Survey of Consumer Attitudes with those from the Georgia State Poll. Because the Georgia State Poll data do

Table 2.   Trend analysis of nonresponse rates, 1980–1999

Survey and Time Period	Regression coefficients for refusal rates			Regression coefficients for nonrefusal rates		
	SCA Monthly, 1980–1999	SCA Quarterly, 1995–1999	GSP Quarterly, 1995–1999	SCA Monthly, 1980–1999	SCA Quarterly, 1995–1999	GSP Quarterly, 1995–1999
Constant	17.17*** (.38)	23.74*** (1.35)	41.89*** (2.45)	8.59*** (.32)	10.20*** (1.14)	16.49*** (1.89)
Time	.03*** (.003)	−1.29 (.71)	2.81* (1.28)	.01*** (.002)	.535 (.60)	1.61** (.516)
Time Squared		.25* (.10)	−.53** (.18)		−.12 (.08)	−.07* (.03)
Time Cubed		−.01* (.004)	.02** (.007)		.01 (.003)	
Durbin-Watson	1.45	1.71	2.43	1.32	2.24	2.48
Adjusted R2	.315	.368	.637	.053	.202	.424

Note: All regression coefficients are unstandardized and standard errors are shown in parentheses. *$p < .05$; **$p < .01$; ***$p < .001$.

not begin until the summer of 1995, we limit our analysis of the SCA to these same years. It is possible that some of our conclusions for a twenty-year period may not hold in this shorter period. To facilitate the comparison, we have also converted nonresponse rates for the Survey of Consumer Attitudes from months to quarters.

As one might expect, the average response rate for the Survey of Consumer Attitudes is slightly lower in the latter half of the 1990s than it is for the series overall (70 percent versus 66 percent, see Table 1). Conversely, the refusal rates were, on average, slightly higher during this period (21 percent versus 24), but the noninterview rate due to causes other than refusals remained the same at 10 percent. These changes, however undesirable, pale in comparison to the differences between the two surveys as illustrated in Figure 2. The Georgia State Poll averaged a response rate half as high and nonresponse rates twice as large as the Survey of Consumer Attitudes (see Table 1). Although this is an alarming finding, we do not believe that the Georgia State Poll is atypical of media and university polls conducted under rigorous methodological procedures. (See Parsons et al. 1999; Keeter et al. 2000; Cox et al. 1999; and CMOR 1995, 1997, 1999.)

The trend analysis of the quarterly data for the Survey of Consumer Attitudes, also given in Table 2, indicates that the refusal and other noninterview rates can no longer be adequately described by linear trends. Instead, a third degree curve provides the best fit to both series. We see in Figure 2 as well that more fluctuation occurs in the GSP time series for both refusals and nonrefusals than in the SCA. In addition, the trends for these types of nonresponse do not trace the same paths in the two surveys. The refusal rate for the Georgia State Poll is described best by a third degree curve, the same as the refusal rate in the SCA. However, the curves bend in different directions. While refusals in the SCA trend upward overall, refusals in the GSP basically decline. Although the
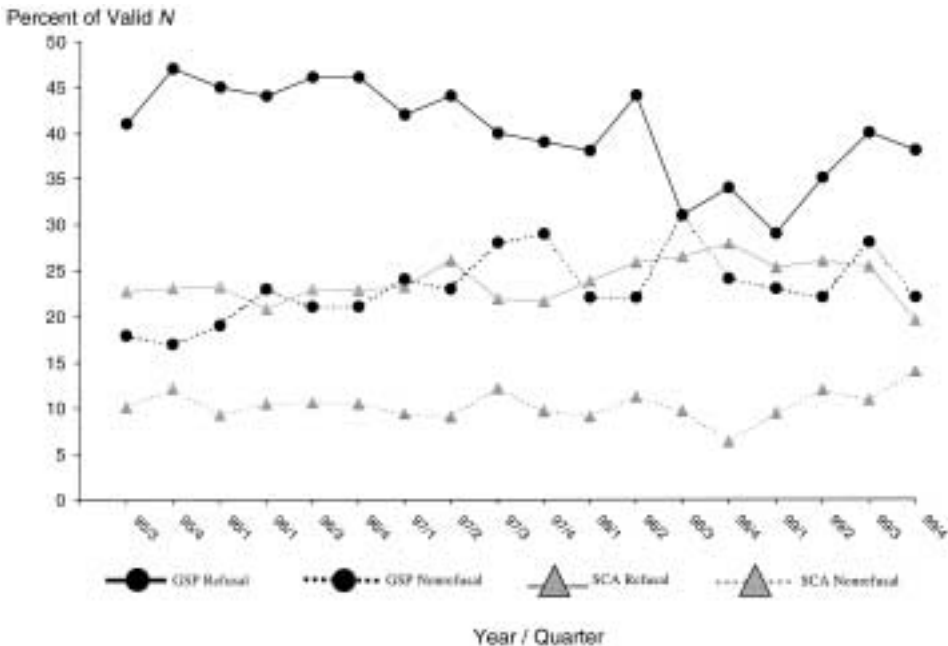

Fig. 2.   *Nonresponse trends, Georgia State Poll and Survey of Consumer Attitudes, 1995–1999*

rates of nonresponse due to reasons other than refusal in the two surveys are described by curves of different degrees and different levels of statistical significance, they are more alike in the overall direction of change – an increase followed by a slight downturn. These data suggest that, for RDD surveys with low overall response rates, progress in reducing refusals may be possible. Had the rate due to other types of nonresponse remained stable, the response rate for the Georgia State Poll would have increased substantially.

6.   Trends by Degree of Urbanization

For surveys that are conducted in person rather than by telephone, we expect to see size-able differences in levels of refusals and other nonresponse across urban areas. Small towns, large cities, and metropolitan areas display monotonically higher levels of refusals as population size and density increase (Groves and Couper 1998; Steeh 1981). It is legitimate to ask whether or not we would find these same patterns in surveys administered over the telephone. There is no clear evidence on this point because RDD samples are not clustered by area as samples are for most personal interview surveys of the general population. This makes it exceptionally hard to determine where telephone households are located. Although area codes and exchanges are certainly available, they are usually too imprecise for the purposes of looking at nonresponse by degree of urban residence. Fortunately businesses that specialize in providing RDD samples now attach a county code (FIPS) to each telephone number included in a sample file.

The availability of this information does not help us categorize data from the Survey of Consumer Attitudes in the same way. In the early 1980s the RDD sample for the SCA was drawn in-house, and FIPS codes are thus not available for these early years. In addition, SCA staff decided not to preserve the FIPS codes in sample files after July 1997. On the other hand, the sample for the Georgia State Poll is nicely suited for this purpose. As we described above, a disproportionate sampling strategy results in half of the survey being conducted in the five-county metropolitan Atlanta area with the other half coming from the remainder of the state. To define urban areas, we used 1990 U.S. Census definitions of metropolitan statistical areas (MSAs). Any county not included in an MSA falls into the nonMSA group. Counties in MSAs other than Atlanta form a category called large cities. Finally, the Atlanta MSA is divided into the five core metro-politan counties (metropolitan) and the remaining fifteen suburban counties (suburban). By looking separately at Atlanta's central core and its suburban ring, we examine the effects of urbanicity in more detail than previous work.

Table 1 displays univariate statistics on response and nonresponse rates for the four groups. The striking feature is the lack of differentiation across areas. Unlike nonresponse in personal interview surveys, where each urban group appears to stand apart from the others, the main impression here is one of similarity. Only Metropolitan Atlanta's some-what higher rate of other nonresponse stands out.

The trend analyses, presented in Table 3, lend support to the conclusion that the urban areas in this particular RDD survey have similar nonresponse levels and similar trends – especially for refusal rates. The overall pattern of change for refusals is curvilinear in all groups except metropolitan Atlanta. In the three cases, however, the curves are the same shape and the linear trend for metropolitan Atlanta also fits the pattern – rising refusal

Table 3.   *Trend analysis of nonresponse rates by urban groups, Georgia State Poll, 1995–1999*

	Overall	Non MSA	Large Cities	Suburban	Metropolitan
	Regression coefficients for refusal rates				
Constant	41.89***	37.66**	36.50***	46.32***	46.10***
	(2.45)	(2.41)	(3.20)	(3.17)	(2.05)
Time	2.81*	4.29**	4.92*	2.23	−.79***
	(1.28)	(1.26)	(1.68)	(1.66)	(.20)
Time squared	−.53**	−.642**	−.789**	−.446	
	(.18)	(.18)	(.23)	(.23)	
Time cubed	.02**	.023**	.030**	.017	
	(.007)	(.007)	(.009)	(.009)	
Durbin-Watson	2.43	2.80	1.78	2.37	1.92
Adjusted R2	.637	.614	.444	.528	.479
	Regression coefficients for other noninterview rates (Sickness, Language Problems, R Unavailable)				
Constant	6.55***	7.32***	6.85***	5.82***	6.38***
	(.82)	(.99)	(1.24)	(1.34)	(.84)
Time	.068	.026**	.058*	.095	.072
	(.08)	(.10)	(.12)	(.13)	(.08)
Durbin-Watson	2.43	2.12	2.18	2.41	2.25
Adjusted R2	.041	.004	.014	.030	.043
	Regression coefficients for noncontact rates (All No Answers, Answering Machines, and Busy Signals)				
Constant	10.67***	9.30***	11.26***	7.30**	12.01***
	(1.43)	(1.05)	(1.75)	(1.66)	(2.18)
Time	1.27**	.870***	.274	1.78**	1.52*
	(.39)	(.28)	(.18)	(.453)	(.594)
Time squared	−.055*	−.032		−.086**	−.068
	(.022)	(.02)		(.03)	(.03)
Durbin-Watson	2.61	2.72	2.05	2.10	2.74
Adjusted R2	.462	.544	.077	.488	.310

Note: All regression coefficients are unstandardized and standard errors are shown in parentheses. $*p < .05$; $**p < .01$; $***p < .001$.

rates from the summer 1995 poll through the second quarter of 1996, then declining rates until the beginning of 1999. Although the differences over time among the groups are never large enough to be significant, the consistent ordering by level is worth mentioning since it does not monotonically follow degree of urbanization as it does in personal interview surveys. Through most of the time series, refusals are highest in suburban Atlanta and lowest in metropolitan Atlanta, a pattern we would not expect given the literature on face-to-face surveys.

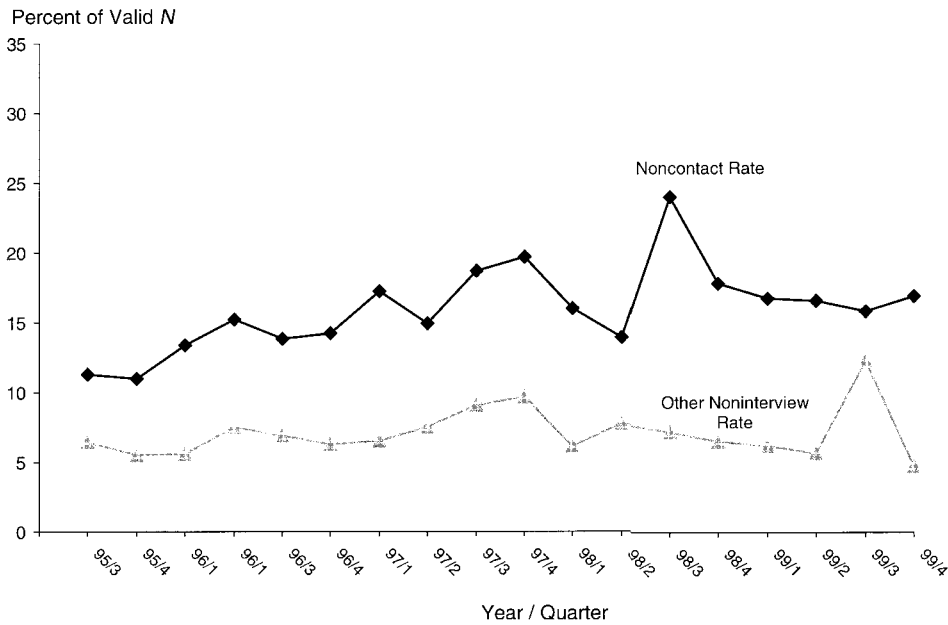Turning to the nonrefusal component of nonresponse, we can for the first time look at

Fig. 3.   *Noncontact and other noninterview trends, Georgia State Poll, 1995–1999*

noncontacts and other noninterviews separately. Figure 3 shows the overall patterns of change in these two types of nonresponse. From the descriptive statistics in Table 4, we see that the noncontact rate (see Appendix for a definition) is approximately two times greater than the other noninterview rate in all urban groups. Degree of urbanization seems to matter only in one respect – the noncontact rate is much higher in the metropolitan area than anywhere else. Otherwise and within type of nonresponse, the levels across groups are nearly the same.

Noncontacts and other noninterviews have different patterns of change. The regression coefficients in Table 3 for other noninterviews reveal that the trend is uniformly linear and flat. However, for noncontacts the trend in all urban groups except large cities resembles a very shallow inverted ''u'' that indicates the increase in noncontacts has moderated somewhat in the last two years. The positive linear change that occurred in large cities is not statistically significant.

To summarize the findings so far, we see evidence at least in the Georgia State Poll that the composition of nonresponse may be changing from mostly refusals to a mix of refusals and noncontacts. The clearest evidence of this can be found in the metropolitan area, where increasing noncontacts offset declining refusal rates. In addition, it appears that refusal rates are not on a relentlessly upward course but can decline, sometimes substantially. Furthermore, we have located a stable component of nonresponse in the other noninterview rate. This type of nonresponse is probably impervious to change since there will be a small proportion of the general population (around seven to ten percent) that is always unavailable for a variety of reasons – sickness, incapacity, unusual work schedules. Other noninterviews due to language barriers might be expected to increase as both the United States and Georgia become more diverse ethnically. We have also

Table 4.   Descriptive statistics for noncontacts and other noninterviews, Georgia State Poll, 1995–1999

	(N)	Noncontact rates		Other noninterview rates	
		Mean	Std. Dev.	Mean	Std. Dev.
Overall	18	15.98	3.1	7.12	1.8
NonMSA	18	13.48	2.4	7.54	2.1
Large cities	18	13.59	4.0	7.34	2.7
Suburban Atlanta	18	13.86	3.6	6.62	2.9
Metropolitan Atlanta	18	18.22	4.1	6.99	1.8

discovered that urban residence is not so important a source of nonresponse in telephone surveys as it seems to be in personal interview surveys. However, our data do not allow us to determine why this is so. We have hypothesized that this is an effect of mode of administration – that people everywhere react in the same way to an anonymous, intrusive telephone call but differently in smaller urban areas when an interviewer appears at the door. However, since we have no evidence from recent face-to-face surveys about this issue, the effect may also be one of time so that even a personal interview survey conducted in the 1990s would show few differences by degree of urbanization.

A surge in noncontacts would have important implications for future research efforts. By the early 1980s we thought we had eliminated noncontacts as a source of nonresponse in major U.S. surveys. We had taken what DeHeer (1999) has called the first step in the battle against nonresponse, that is, reducing the noncontact rate, and had proceeded to the second step, reducing refusals. As a result, much of the recent research literature has focused on the unwillingness of chosen respondents to be interviewed in face-to-face surveys and how this can be overcome. Our findings suggest that we may need to go back to the first step, at least in RDD surveys, and once again focus our attention on contacting sample households.

7.   Composition of Other Nonresponse

Given the increasing importance of noncontacts as a threat to the representativeness of RDD surveys, it seems important to ask why this is happening. The increase in technologies that make it more difficult to contact people through the telephone might be a likely source. However, no empirical information exists to tell us how these technologies may be affecting nonresponse rates over time. Given the fact that pager numbers and cellular telephone numbers are not included in RDD samples and caller id cannot be detected by an interviewer ringing a household, we can only track answering machine use. Again we rely only on data from the Georgia State Poll for evidence. Although the Survey of Consumer Attitudes records answering machine dispositions, the code is interim and cannot presently be recovered for surveys administered with paper and pencil, thus depriving us of a long-term perspective. A rough measure of answering machine prevalence can be obtained by summing across all call attempts that have a nonresponse disposition other than refusal and then calculating the percent answered by a machine.

The regression coefficients in Table 5 show that answering machine prevalence in three of the urban groups changes only modestly and assumes in each an inverted u-shape

Table 5. *Regression coefficients for nonresponse due to answering machines by urban group, Georgia State Poll, 1995–1999*

	Non MSA	Large cities	Suburban	Metropolitan
Constant	18.72***	25.19***	30.41***	46.65***
	(1.64)	(2.11)	(2.06)	(2.67)
Time	.772*	−.937*	−.656	−.832***
	(.32)	(.417)	(.407)	(.184)
Time Squared	−.030	−.040*	−.038*	
	(.014)	(.018)	(.018)	
Durbin-Watson	1.88	2.29	2.42	1.83
Adjusted R2	.202	.159	.215	.532

Note: All regression coefficients are unstandardized and standard errors are shown in parentheses. *$p < .05$; **$p < .01$; ***$p < .001$.

pattern. In the metropolitan area, by contrast, the decline in the percentage of answering machine dispositions is dramatic and puzzling. At the risk of overinterpreting the results, it appears that residents of metropolitan Atlanta and possibly its suburbs (note the significant negative time-squared term in Table 5) are using answering machines less over time. The quadratic trend for small towns and large cities suggests also that answering machine use, as it is manifest in telephone surveys, may be declining as well. For the first time, we see the monotonic stacking of urban areas, at least until 1999, that appeared so noticeably for the two major types of nonresponse in personal interview surveys twenty years ago. The metropolitan area usually shows the largest percentage of answering machine dispositions while the nonMSAs show the least. These differences have narrowed considerably over time so that in the most recent Georgia State Poll the ordering by urban groups is no longer monotonic. Thus if noncontacts are increasing relative to refusals, it is not because there is an overwhelming increase in the probability of reaching an answering machine on any given call attempt.

What, then, replaces answering machines in metropolitan contexts? Figure 4 provides a tentative, albeit unsatisfying, answer for the five central counties of metropolitan Atlanta. When we look at all the call attempts in this area with dispositions that indicate nonresponse other than refusals, we see that the most likely outcome is increasingly a no answer or a busy disposition. What does this mean? Are answering machines being replaced by telephone technologies that cannot be detected by interviewers, such as caller id? Does reliance on pagers, electronic mail, and cellular telephones make the answering machine obsolete – perhaps even the conventional telephone itself? If this is a portrait of the future, it makes sense that we would see it first in metropolitan areas, especially in such ''wired'' cities as Atlanta.

8.   Adequacy of Efforts to Combat Future Nonresponse

These developments have occurred despite monumental efforts to reduce nonresponse. In recent studies interviewer training has been emphasized as a way to counter increasing nonresponse (Groves and Couper 1998; Morton-Williams 1993). Suffice it to say, these persuasive skills may be effective once interviewers make contact with someone in a
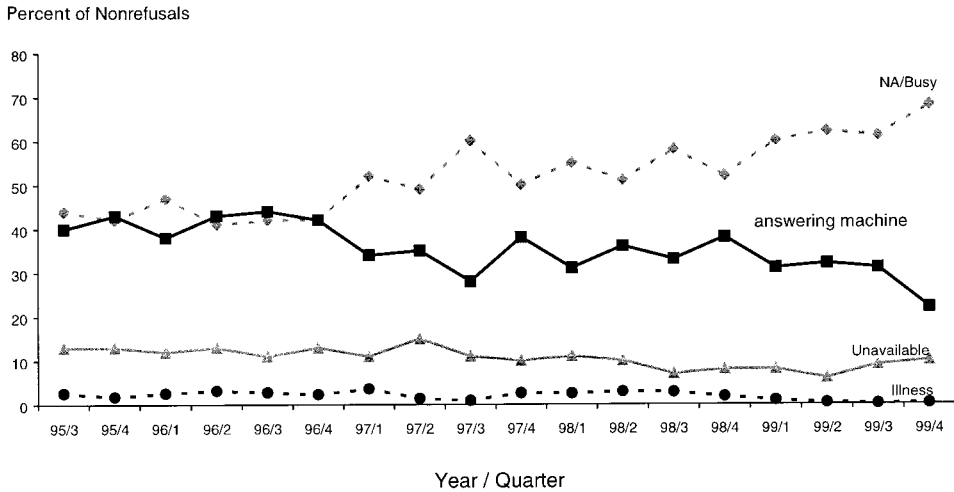
Percent of Nonrefusals

Fig. 4.   Types of nonresponse other than refusals, Metropolitan Atlanta, Georgia State Poll, 1995–1999

household. Unfortunately, our analyses indicate that this may become harder and harder, if metropolitan areas are harbingers of the future.

In addition to improving interviewer skills as a way of reducing refusals, survey organizations have stressed the conversion of initial refusals into interviews. Data from both the Survey of Consumer Attitudes and the Georgia State Poll on refusal conversions allow us to gauge how useful this standard procedure has been in recent years. In Figure 5 we display refusal conversion rates for the two surveys as percents of total interviews. Overall, the conversion rate averages for the two surveys since 1995 are approximately the same, 14.5 for the SCA and 15.2 for the GSP. Although the trends for both surveys are linear, they move in opposite directions. The percentage of interviews that are obtained through refusal conversions has increased in the Survey of Consumer Attitudes ($b = .287$, $p < .01$) but declined in the Georgia State Poll ($b = -.466$, $p < .1$). Thus while refusal conversion efforts may have operated to slow the rise in the refusal rate for the SCA, they have had little to do with the outright decreases in refusal rates for the GSP. Refusal conversions across urban groups in the Georgia State Poll decline in each, as we might expect. We also see a very slight tendency from 1994 to the middle of 1997 for refusal conversions to be more successful in the Atlanta suburbs. After that, levels across all groups become indistinguishable from one another.

Beginning in 1995, the Survey of Consumer Attitudes offered incentives, including differential incentives for refusal conversion, to potential respondents in exchange for their participation in the interview. A number of experiments were conducted to gauge the effect of these incentives (Singer et al. 2000), and it is exactly at this point that the rise in refusal conversion rates became most pronounced. Prior to 1995 the linear increase in the percentage of interviews resulting from refusal conversion was a modest .05 percent each quarter ($p < .05$), compared to .29 percent ($p < .01$) from 1995 on. How much offering differential incentives contributed to this rising conversion rate has not been calculated, but it undoubtedly had some effect. That the Georgia State Poll has never
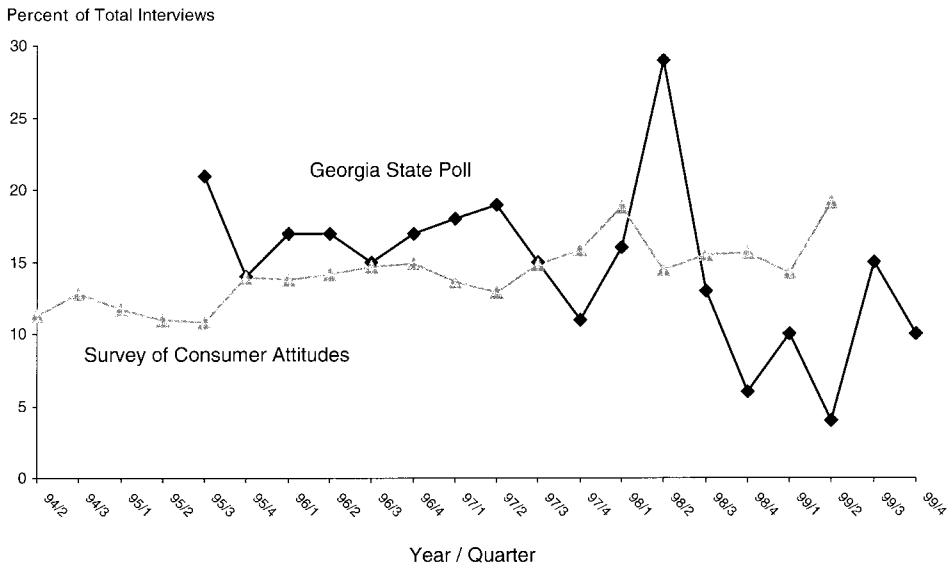
Percent of Total Interviews

Fig. 5.   *Refusal conversions, Georgia State Poll and Survey of Consumer Attitudes, 1995–1999*

offered any kind of incentive for any purpose to any respondent deprives the survey of a possible means for lowering its nonresponse. Although we know that in the 1990s incentives were offered by both surveys as rewards to interviewers for increased productivity, we have been unable to determine whether the SCA has institutionalized this practice or used it only sporadically. Interviewer incentives were never standard procedure for the Georgia State Poll but have been offered on occasion.

Another method used to decrease nonresponse in surveys has been to place more and more calls to eligible sample units. Both the Survey of Consumer Attitudes and the Georgia State Poll permit unlimited callbacks. Thus by tracking this indicator over time we can see how much this effort has changed to meet the challenge posed by rising nonresponse. Figure 6 indicates that for both surveys, the average number of calls has increased exponentially since 1997 so that the number of calls per sample unit averaged 10 for the July, 1999, Survey of Consumer Attitudes and 10 for the 1999 fall Georgia State Poll. The dramatic change in the average number of calls for the Georgia State Poll is due most likely to an increase in the length of the field period – from approximately 15 days through the beginning of 1998 to 34 days for the remainder of 1998 and 1999. Lengthening the field period is not a strategy available to the monthly Survey of Consumer Attitudes in its efforts to limit nonresponse.

The two strategies that have seemed most promising – interviewer training and refusal conversions – depend on the interviewer's being able to talk to a person in the sample household. Thus they will not be effective in combating noncontacts. Prepaid incentives might encourage households to make themselves available to interviewers if addresses could be obtained for sample units, a procedure that is not achievable at present. That leaves only attempting untold numbers of callbacks and lengthening the field period as viable methods for overcoming increasing noncontacts. This conclusion means that
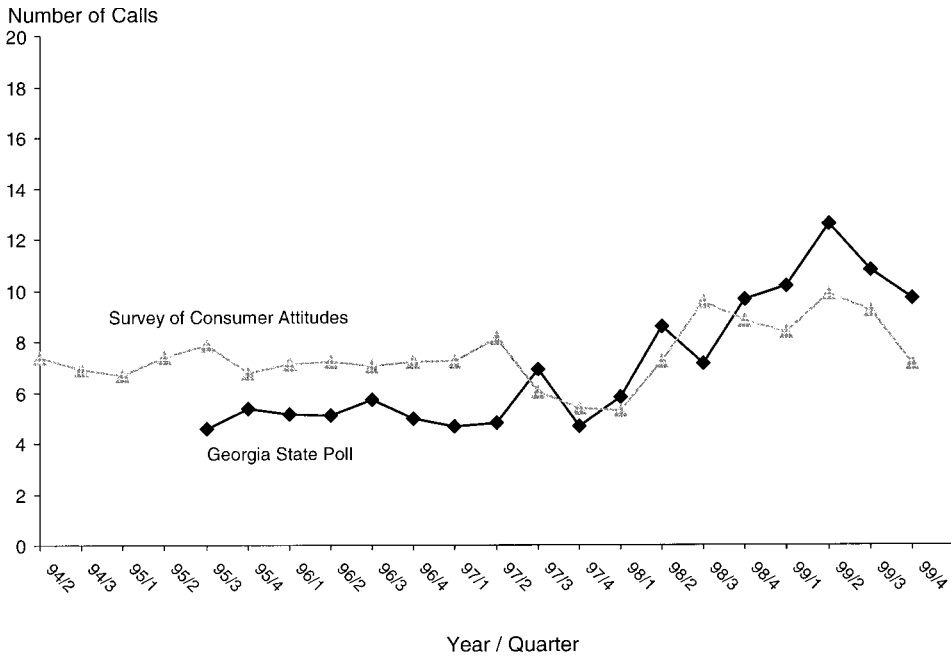
Number of Calls

Fig. 6.   Average number of call attempts, Georgia State Poll and Survey of Consumer Attitudes, 1994–1999

telephone surveys will become more and more expensive and, when the field period is extremely short, less and less reliable.

9.   Conclusions

Let us see now where we stand. Are nonresponse rates really as bad as they seem? The answer to our first research question is both ''yes'' and ''no.'' Nonresponse is not getting a lot worse, but it is also not getting better. On the positive side, in the national survey we have examined the sizeable increase in nonresponse – especially refusals – that occurred during the 1960s and 1970s has moderated in the 1980s and 1990s, perhaps temporarily but noticeably nonetheless. In one state-level survey, the basic movement, though decidedly uneven, was a definite decline in refusals overall as well as across the urban areas we studied – strikingly so in the metropolitan area.

The bad news here, however, is that refusal rates are not decreasing or moderating because potential respondents are more willing to talk to survey interviewers over the telephone. Rather what we are seeing, for sure in the case of the Georgia State Poll, may be a change in the character of nonresponse. Evidence of this is only clearly apparent in the metropolitan area where refusals significantly declined and noncontacts significantly increased. For the other areas in Georgia, increases in the percentages of noncontacts have not yet counterbalanced the declines in refusal rates. In these cases, refusals decreased enough to positively affect response rates for a time, but continuation of this trend is likely only if both rates remain steady. Unfortunately, the trade-off in types of nonresponse, most evident in the Atlanta metropolitan area and presumably other metropolitan areas in the United States, will undoubtedly spread in future years to less urbanized

places. Furthermore, it appears that this increase in noncontacts in a metropolitan area is not due to a growing percentage of call attempts that access an answering machine but instead to the growing percentage of attempts that do not access anything and result in a 'no answer' or 'busy' outcome. Thus we argue that the character of nonresponse is shifting from a preponderance of refusals to a combination of refusals and noncontacts, although our conclusions must remain tentative for the time being. We have also identified a source of nonresponse that changes very little over time. The proportion of potential respondents who cannot speak the language, are too sick to be interviewed, or are unavailable through the entire study period is nearly equal across the two surveys and across urban areas. This component represents the amount of nonresponse we may always expect to get in surveys even if we were able to get rid of refusals and noncontacts.

Finally, in answer to our third research question, we find that nonresponse to RDD telephone surveys differs from nonresponse to personal interview surveys in several major ways. Refusal and noncontact rates in RDD surveys do not vary substantially by urban group. Furthermore, the sizeable increase in refusal rates that characterized the years 1952–1979 appears to have leveled off at worst and improved promisingly at best in these two RDD surveys. We also think that the character of nonresponse will not change over time as much in personal interview surveys as in telephone surveys. As we mentioned earlier, the proliferation of telephone technologies such as caller-id, cellular telephones, and pagers makes the probability of noncontacts much higher in the telephone mode of administration.

The differences in overall trends between the Survey of Consumer Attitudes and the Georgia State Poll suggest that one single process of change cannot adequately describe nonresponse at the end of the twentieth century. The trends for the three types of nonresponse we studied with data from the Georgia State Poll have different shapes, although it is not clear why this is so. Refusals can best be described by a cubic function whereas a quadratic equation best fits the movement of the noncontact rate over time. Furthermore, the category of other noninterviews exhibits no change. Even when we look at the curvilinear trends we see no sign of seasonal patterns of consequence for either survey, and we have been unable to tie the broad cycles we traced to specific changes in survey methods, such as others have found (Djerf 1999; DeHeer 1999). Even the introduction of computer assisted interviewing and the partial decentralization of the interviewing staff during 1996 and 1997 noted in the Appendix left no impression on the SCA trends.

Our findings point to a more general conclusion. They suggest that telephone surveys in general and RDD surveys in particular will become less reliable and valid in the twenty-first century. In fact, evolving communications technology promises to increase noncontacts, especially in surveys with short interviewing periods and limited callbacks.

What can we do to remedy these deficiencies? In the future more attention needs to be paid to nonresponse other than refusals, especially in RDD surveys. The outcomes of all call attempts must be clearly defined and coded to ensure comparability over time and survey organizations, something rarely discussed in the methodological literature. The extent to which cell phones, pagers, caller-id influence participation in surveys needs to be continuously tracked. Finally, telephone samples will eventually have to include cellular phones, and we must understand what ramifications this will have on sample design.

Appendix. Design features of the two surveys

Survey Feature	Surveys of Consumer Attitudes	Georgia State Poll
Scope	National	State level
Sample design	RDD since 1977; List assisted RDD since 1996	List assisted RDD
Frequency of administration	Monthly	Quarterly (January–February; April–May; July–August; October–November)[a]
Eligible respondent	Adult 18 and over living in a household	Adult 18 and over living in a household
Selection method	Kish selection to summer of 1997; Random selection thereafter	Last birthday except summer 1999 when Kish selection used
Topics covered	Omnibus with slant toward economic conditions; nonthreatening	Omnibus with slant toward political issues; nonthreatening
Sponsor	University of Michigan	Georgia State University
Number of call attempts[b]	Unlimited; One callback if first call is fax, computer, or cellular phone	Unlimited; One callback if first call is fax, computer, or cellular phone
Nonsample definition	Disconnected numbers, cellular telephone numbers, business numbers, no adult in household at least 18, fax and computer lines, and numbers not answered after six calls if three of the calls are on different days.	Disconnected numbers, cellular telephone numbers, business numbers, no adult in household at least 18, fax and computer lines, and numbers called at least six times that are never answered by a person or an answering machine.[c]
Refusal conversion	Attempted at least once	Attempted at least once
Length of field period	Less than 30 days	Usually 15–25 days
Length of interview	30–35 minutes	15 minutes
Date of initial survey	1952	1992
Date of first CATI survey	August 1996–May 1997[d]	1992

Treatment of partial interviews	Treated as an interview for calculating response rates	Treated as a refusal unless demographic information was obtained[e]
Incentives to respondents	Sporadically since 1996	None
Incentives to interviewers	Yes	Occasionally
Definition of refusal	Final refusal by respondent or by someone other than the respondent; final refusal before the respondent could be determined; more than two postponements of an interview	Final refusal by respondent or by someone other than the respondent; final refusal before the respondent could be determined; more than two postponements of an interview; break-off interviews
Definition of noncontact	No answer, answering machine, or busy on every call attempt	No answer, answering machine, or busy on every call attempt
Number of RDD interviews per quarter	900	800

[a]The survey begins at the end of the first month and extends into the second month.

[b]Undoubtedly the SCA has, in the past, scheduled callbacks more carefully than the GSP which has only recently instituted a rotating schedule to ensure that call attempts are made on various days at various times.

[c]The overall percentages of these numbers with only no answer and busy dispositions and more than six attempts ranged between .1% and 4.4% of the total selected sample with most falling under 2%.

[d]The entire period after the survey's conversion to computer assisted interviewing seems to have been one of flux that undoubtedly increased the difficulty of assigning final dispositions. The problems inherent in switching from paper and pencil to computer assisted interviewing were made worse by the decentralization of the interviewing staff from August 1997 to June 1998 when remote field interviewers worked on the survey along with the regular telephone interviewing staff housed at the Survey Research Center.

[e]Since the questions that obtained information about the respondents appear at the end of the GSP, it is unlikely that any partial interviews passed this test.

The evidence presented here should act as a wake-up call. Much research energy and time have been spent studying refusals in major personal interview surveys. While these efforts are theoretically important and insightful, they clearly deal with a different set of problems than most survey researchers face. Although refusals are always troublesome, they are not as problematic as not being able to contact potential respondents to give them the chance to refuse or participate.

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